REMARKS

As mentioned above, claims 1-26 were rejected in the Office Action mailed September 3, 2002. More specifically, claims 1-26 were first rejected under 35 U.S.C. § 112, while claims 1, 4, 5, 11, 12, 16 and 17 were rejected under 35 U.S.C. § 102(b), and claims 2, 3, 6-10, 13-15, 18-26 were rejected under 35 U.S.C. § 103(a). In light of the above-referenced amendments, and the following comments, Applicant respectfully submits that these rejections are improper and requests allowance of all pending claims.

Claim Rejections Under § 112

In response to the initial rejection under 35 U.S.C. § 112 certain modifications to claim 1 have been made to clarify any uncertainty that may have been perceived by the existing language. Consequently, claim 1 is believed to meet all requirements of certainty and definiteness following these amendments.

In the Examiner's further rejections under 35 U.S.C. § 112, certain language of claims 1, 12, and 26 (assumed to mean claim 20) has been ignored and not been given any patentable weight as it allegedly was not supported by sufficient structure. In support of this rejection the Examiner cites *In re Fuller* 1929 C.D. 172; 388 O.G. 279 -- a case from 1929 dealing with the processing of wool. The Applicant respectfully submits that this rejection is improper and requests appropriate reconsideration of these claims.

Initially, the Examiner's rejection is confusing in that it appears to contradict itself. More specifically, the Examiner stated "In order to be given patentable weight, a functional recitation must be expressed as a "mean" for performing the specific function, as set forth in 35 U.S.C. § 112, 6th paragraph and must be supported by a recitation in the claim of sufficient structure to warrant the presence of functional language." Citing *In re Fuller*, 1929 C.D. 172; 388 O.G. 279. As has been discussed in many decisions from the Courts, the application § 112, paragraph 6 depends upon the presence of structure in the claim. If sufficient structure is recited in the claim element, clearly § 112, paragraph 6 does not apply. Conversely, where an applicant intends to provoke the principals of § 112, paragraph 6, functional language is included without the existence of structure. Consequently, the Examiner's above quoted language is contradictory and difficult to understand.

With regards to the actual language rejected under 35 U.S.C. § 112, the Applicant submits that sufficient structure is present. The claims in question recite "a noise reduction feedback network ...". As is well recognized by those skilled in the electronics' art, the concept of a feedback network is a well understood structure for relating various signals. A feedback network is a common structure typically used in control circuits of all types. In the present invention, this structure is used to minimize noise present in a laser signal. The recited term "feedback network" would be easily recognized by one skilled in the art as a structural element within the laser control system being claimed. Despite the above comments, certain modifications have been made to some of these claims to further clarify the structure being claimed.

The Examiner's basis for this § 112 rejection is further confusing when the *Fuller* case is examined in detail. In the *Fuller* case the invention involved a process for constructing a woolen fabric for clothing. The claim in question recited the characteristics of the woolen product itself. Further, the decision indicates that the claim in question described imperfectly and too broadly a different manufacture than that described in the specification. As outlined above, this is simply not the case in the present application.

In summary, the Applicant respectfully submits that pending claims 1-26 (as amended) meet the requirements of 35 U.S.C. § 112. All issues related to uncertainty have been clarified. Further, these claims all recite the basic structural elements making up the claimed invention. Patentable weight should be given to the claim terms and 35 U.S.C § 112, paragraph 6, does not apply. Additionally, for comparison, new claims have been added which are drafted in a means plus function format.

Claim Rejections Under 35 U.S.C. § 102

Initially, the Applicant hereby reminds the Examiner that the present invention is related to the control of a laser so that noise is substantially reduced. As more fully described in the specification, the laser is driven by a laser driver in order to accommodate the writing and reading of information to an optical storage disk. The laser driver, by its nature, is required to vary the current to the laser in order to produce the laser signals (optical signals) required for its operation. Consequently, this requires a very dynamic operating environment. In such an

environment, the present invention provides the advantage of eliminating a noise floor existing in the laser signal, resulting in fewer problems and errors during operation.

Claims 1, 4, 5, 11, 12 and 16-17 were rejected under 35 U.S.C. § 102(b) as anticipated by Yao et al. For the reasons outlined below, the Applicant submits that Yao et al. discloses a much different device, and does not contain sufficient teaching or disclosure to anticipate any of the pending claims.

As suggested above, the present invention is not an oscillator. Conversely, Yao et al. discloses an oscillator for use in creating a stable signal in both the optical and electrical domains. More specifically, the frequency and amplitude of these optical and electrical signals are maintained constant. Consequently, the oscillator of Yao et al. can easily be used in many different communication related applications such as clock recovery or character regeneration. Most significantly, the oscillator of Yao et al. does not include a control device working with a laser driver which dynamically changes current to the laser. Such inclusion in Yao et al. would teach away from its major focus, as constant frequency and amplitude is critical in its application.

Regarding certain details allegedly taught by Yao et al., none of these indications are considered relevant in light of the comments mentioned above. However, it is worth specifically noting that Yao et al. does not mention the type of filtering or noise reduction feedback networks that are set out and claimed in claims 4, 5, 11, 16 or 17. Furthermore, in the details of Yao et al., it is indicated that the amplifier and filter portions are "not critical components and are thus optional". See column 4, lines 6-11. This text further highlights the purpose of the Yao et al. device – to create a stable oscillation signal. Consequently, the amplifier and filter used therein are simply present to remove unwanted oscillation modes and harmonic signals. This is clearly different from the present invention which is intended to reduce or minimize noise.

Claim Rejections Under 35 U.S.C. § 103

Claims 2, 3, 7, 8, 10 and 18 were rejected under 35 U.S.C. § 103 as unpatentable over Yao et al. in view of Logan. Each of the above-referenced comments related to Yao et al. are equally applicable here. Consequently, the Applicant submits that these rejections under 35 U.S.C. § 103 are similarly inappropriate. In addition to the comments above related to Yao et al., Logan also discloses a much different device and is not utilized to minimize noise in an

optical signal. Logan is a heterodyne optical signal generator, which again, is utilized to generate a stable signal of a single frequency. Based on this different application, it is unreasonable to conclude that Logan is any way related to the invention of the present application. Further, in Logan, feedback is utilized to adjust frequency of one of the signals involved, and not directed towards noise reduction. In summary, Yao et al. and Logan do not provide sufficient teaching to render obvious any claims of the present invention.

In addition to the references mentioned above, various other references were utilized to reject certain claims. For example, Blauvelt is cited by the Examiner as relevant to claims 6, 9, 13-15 and 25. Blauvelt is directed towards linearization of electronic and optical signals. Simply stated, the present invention has nothing to do with linearization.

Similarly, Arnett et al. is cited in rejecting claims 19-26. Arnett deals with the problems related to "kinks" of the recording process. Again, this has nothing to do with the invention of the present application.

For the reasons stated above, the Applicant respectfully submits that all pending claims are allowable. In the submission of additional claims, the Applicant has calculated that $402 is due for additional claim fees and hereby authorizes the Commission to charge this amount to our Deposit Account No. 50-1901.

Should the Examiner have any questions regarding the above referenced comments and or amendments, it is respectfully requested that the undersigned be contacted via telephone to expeditiously deal with any issues.

Respectfully submitted,

By

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Appendix A – Version with markings to show changes made

Application No. 09/851,287

IN THE CLAIMS:

Please amend claims 1, 2, 7, 10, 12 and 20 as follows:

1. A **[low noise]** laser noise control system operating in conjunction with a laser driver so as to control a laser, the laser noise control system comprising:

an optical sensor positioned to receive a portion of a light signal generated by the laser, the optical sensor thus capable of producing **[and produce]** a signal indicative of the laser beam generated by the laser; and

a noise reduction feedback network operatively connected to the optical sensor and to the laser, the noise reduction feedback network **[including filtering and impedance characteristics]** configured to include a filter circuit so as to produce a filtered noise reduction signal which is provided to the laser for combination with a laser driver signal produced by the laser driver.

2. The low noise laser control system of claim 1 further comprising a LF control loop operatively attached between **[the laser and]** the optical sensor and the laser driver to provide CW control of the laser.

7. The low noise laser control system of claim 3 wherein the LF control loop includes a processor attached to the trans-impedance amplifier, the processor further having an output attached to **[a]** the laser driver **[which drives the laser]**, the processor output carrying a LF control signal which allows the laser driver to provide appropriate levels of current to operate the laser at a desired CW level.

10. The low noise laser control system of claim 3 wherein the LF control loop includes an amplifier network attached to the output of the trans-impedance amplifier, the amplifier having an output attached to **[a]** the laser driver **[which drives the laser]**, the amplifier output carrying a LF control signal which allows the laser driver to provide appropriate levels of current to operate the laser at a desired CW level.

12. A low noise laser control system for use in controlling a laser within a data storage drive, comprising:

an optical sensor associated with the laser to produce a sensor signal indicative of the laser beam being produced by the laser and directed toward a storage media;

an amplifier attached to an output of the optical sensor for producing an amplified signal which is inverted with respect to the sensor signal;

a noise reduction feedback network **[connected to]** having a circuit connection between the amplifier **[for receiving the amplified signal, the noise reduction feedback network further connected to]** and the laser in order to receive the amplified signal and to provide a filtered noise signal to the laser, wherein the filtered noise signal will cancel **[any]** noise present on the laser beam.

20. A laser control system attached to the read/write laser of an optical data storage system which is directed toward a data storage medium, the control system comprising:

a laser driver attached to the laser for providing a laser drive signal which controls the operation of the laser;

an optical sensor coupled to the laser to receive a portion of the laser signal produced by the laser and provide a sensor output proportional to the power of the laser signal;

an amplifier attached to the optical sensor for producing an amplified signal, the amplified signal being inverted and amplified when compared with the sensor output;

a processor attached to the amplifier and the laser driver, the processor receiving the amplified signal and producing a laser control signal to control the intensity level of the laser; and

a noise reduction feedback network having a circuit connection between **[coupled to]** the output of the amplifier and **[to]** the laser, the noise reduction feedback network receiving the amplified signal and providing a cancellation signal to reduce the noise in the laser signal directed to the optical medium.

Please add new claims 27-39 as follows:

--27. A laser control system for operating a laser, comprising:

an optical sensor positioned to receive a portion of an optical signal produced by the laser, the optical sensor thus producing a sensor signal responsive to the optical signal; and

noise reduction means for receiving the sensor signal from the optical sensor and producing a noise reduction signal which is then provided to the laser to cancel noise present in the laser.

28. The laser control system of claim 27 wherein the noise reduction means is a feedback network.

29. The low noise laser control system of claim 27 further comprising a LF control means operatively attached between the laser and the optical sensor to provide CW control of the laser.

30. The low noise laser control system of claim 29 further comprising a trans-impedance amplifier attached to an output of the optical sensor, the trans-impedance amplifier producing an amplified signal proportional to the optical sensor signal and providing the amplified signal to both the LF control means and the noise reduction means.

31. The low noise laser control system of claim 29 wherein the noise reduction means is a band pass filter.

32. A laser noise reduction system for use in conjunction with a laser which is driven by a laser driver, the laser noise reduction system comprising:

an optical sensor positioned to receive a portion of the laser beam generated by the laser and to produce a sensor signal indicative of the laser beam;

a noise reduction feedback circuit having an input connected to the optical sensor so as to receive the sensor signal and an output connected to the laser, the noise reduction feedback circuit having filtering circuitry and inversion circuitry such that a noise reduction signal is generated at the output which is an inverted and filtered version of the sensor signal.

33. The laser noise reduction system of claim 32 wherein the noise reduction feedback circuit is a series RCL circuit.

34. The low noise laser control system of claim 32 wherein the RCL circuit is configured to provide a band-pass function.

35. The low noise laser control system of claim 32 wherein the noise reduction feedback network is a high-pass transistor amplifier network.

36. The low noise laser control system of claim 32 further including an LF control loop including a processor attached to a trans-impedance amplifier, the processor further having an output attached to the laser driver, the processor output carrying a LF control signal which allows the laser driver to provide appropriate levels of current to operate the laser at a desired CW level.

37. The low noise laser control system of claim 36 wherein the noise reduction feedback circuit is a series RCL circuit.

38. The low noise laser control system of claim 36 wherein the noise reduction feedback circuit is a high-pass transistor amplifier network.

39. The low noise laser control system of claim 32 further comprising a control switch to selectively operate the noise reduction feedback network.--